

In the further study of the Meloidæ the student will find the following works of value :—

1853. Leconte, J. L. Synopsis of the Meloides of the United States. Proc. Acad. Nat. Sci., Phil., VI.
1866. Leconte, J. L. New Species of North American Coleoptera. Smithsonian Institution. *Pyrota*, p. 159; *Pomphopæa*, p. 160.
1873. Horn, Geo. H. Revision of the Species of Several Genera of Meloidæ of the United States. Proc. Am. Phil. Soc., XIII.
1875. Horn, Geo. H. Synonymical Notes and Descriptions of New Species of North American Coleoptera. *Zonitis*, p. 155. Tr. Am. Ento. Soc., V.
1878. Horn, Geo. H. Contributions to the Coleopterology of the United States, No. 2. *Calospasta*, p. 59. Tr. Am. Ento. Soc., VII.
1880. Leconte, J. L. Short Studies of North American Coleoptera. Trans. Am. Ento. Soc., VIII. *Nemognatha*, p. 212.
1885. Horn, Geo. H. Studies among the Meloidæ. Trans. Am. Ento. Soc., XII.

In addition to the above, a few notes on the smaller genera have been published, and certain portions of various larger ones gone over, but these titles have been omitted for lack of space.

THE NORTH AMERICAN SPECIES OF GNATHODUS.

BY CARL F. BAKER, FORT COLLINS, COLO.

The genus *Gnathodus*, as at present accepted, includes forms closely allied to *Cicadula*, but differing in having only two apical cells in the wing. They are of a weaker build than species of *Cicadula*, and a characteristic appearance from above makes them readily distinguishable from any of that genus. The species are very variable and difficult to define. They are small, more or less slender, greenish, yellowish, or whitish Jassids, usually without distinct markings. The ocelli are distant from the eyes. The clypeus usually somewhat exceeds the genæ. The ovipositor rarely exceeds the pygofer. In the United States at least, most of the species are of very wide distribution.

TABLE OF SPECIES.

- A. Head wider than pronotum; vertex not at all produced; colour very pale sordid greenish-fuscous, elytra whitish-subhyaline, sternum black; length, 3-3.25 mm. *abdominalis*.
- AA. Head narrower than pronotum, often much so.

- B. Sternum green or yellow.
- C. Size medium to small; length, 3-4.25 mm.; vertex not strongly produced.
- D. Elytra whitish-translucent; head and thorax pale olive-green; slender; length, 3.5-4 mm. *impictus*.
- DD. Elytra whitish-subhyaline, greenish to yellow on basal two-thirds; head and thorax yellow or yellowish-green; robust, length, 3.75-4 mm. *impictus*, var. *flavus*, n. var.
- DDD. Elytra pale greenish-hyaline; head and thorax green; slender, length, 4.25 mm. *medius*, n. sp.
- CC. Size large; length, 5 mm.; vertex strongly produced; yellowish throughout, with hyaline elytra. *manitou*.
- BB. Sternum black.
- E. Face at least, and usually vertex, pronotum, and scutel, with distinct fuscous markings.
- F. Elytra not distinctly maculated with black; vertex not produced. *confusus*.
- FF. Elytra more or less strongly marked with black; vertex distinctly produced. *punctatus*.
- EE. Face, vertex, pronotum, and scutellum, greenish, without distinct fuscous markings.
- G. Elytra whitish-translucent throughout; veins narrowly greenish; slender, length, 4.25 mm. *occidentalis*, n. sp.
- GG. Elytra pearly-white, green towards the base; veins broadly green; robust, length, 4.5 mm. *Livingstonii*, n. sp.

Gnathodus abdominalis, VanD.

1892. VanDuzee, CAN. ENT., XXIV., p. 113.

1894. VanDuzee, Trans. Am. Ent. Soc., XXI., p. 307.

1895. Gillette & Baker, Prelim., List Hemip., Colo., p. 104.

1895. Gillette, 7th Ann. Rep. Colo. Exp. Sta., p. 60.

Head wider than pronotum. Face a fourth wider than long. Front two-sevenths longer than wide, two and one-sixth times longer than the clypeus. Clypeus broader at base than at tip, sides subparallel or slightly incurved, tip broadly rounded. Vertex evenly rounded, not produced. Pronotum two and one-eighth times as wide as long, length two and a fourth times that of the vertex, hind margin nearly straight, curvature about half of the length. Ovipositor exceeding the pygofer. Hind margin of the last ventral segment in the female apparently slightly

bisinate. Plate in male evenly rounded; valves narrowly, strongly produced, exceeding the plate by twice its length; tips straight.

Colour pale yellowish-fuscous on the head and thorax, the latter sometimes with three faint longitudinal fuscous stripes. Front more or less washed with rufous. Elytra whitish-subhyaline; sternum black. Abdomen above black except margins of segments. Venter yellow. Length, 3 mm.

The above description was prepared from Colorado specimens determined as straight *abdominalis* by Mr. VanDuzee. The distribution of the species in Colorado, as far as determined, is given in Prelim. List Hemip. Colo. In this State it has been recorded from barley and sugar-beet. The species was originally described from New Jersey (Smith). I have before me, also, specimens from the collection of the Ill. State Lab. Nat. Hist., bearing data as follows: June 19, on wheat; July 27; Sept. 17, on wheat.

In the original description, Mr. VanDuzee says of the male genitalia: "Valve large, as long as the two apical ventral segments taken together; apex angled, subacute. Plates but little surpassing the valve, etc." However, in our specimens—determined by Mr. VanDuzee—they are as described above. In this genus, within certain limits, the genitalia are variable in form. Moreover, as among Typhlocybrids, many marked changes are produced in the genitalia by drying, so that most characters drawn from these parts require verification in fresh specimens.

In this species the ocelli are rather nearer to the eyes than is usual in the genus.

Gnathodus impictus, VanD.

1892. VanDuzee, CAN. ENT., XXIV., p. 113.

1894. VanDuzee, Trans. Am. Ent. Soc., XXI., p. 307.

Head narrower than the pronotum. Face one-sixth wider than long. Front two-sevenths longer than wide, twice the length of the clypeus. Clypeus as broad at tip as at base, sides subparallel, tip strongly, evenly rounded. Genæ broad below the loræ. Vertex distinctly produced. Pronotum little less than twice wider than long, length two and a-half times that of the vertex, hind margin distinctly incurved, curvature less than half the length. Ovipositor about equalling pygofer. Hind margin of last ventral segment of female truncate or slightly incurved. Plate in male strongly rounded; valves strongly produced; tips as long as discs, slender, incurved at apex; valves and pygofer with strong white spines.

Colour green, yellowish beneath and on scutel; anterior edge of pronotum and basal angle of scutel with faint indications of rufous. Abdomen above, except margins of segments, black. Elytra whitish-translucent, costa at base sometimes greenish. Length, 3.5-4 mm.

The above description was made from a male and female collected at Lakeland, Md. (F. C. Pratt). These do not fit the original description exactly in the form of the male genitalia, but the difference is not specific and the specimens are otherwise typical. I also have specimens before me from Salineville, Ohio (Cornell Univ. Coll.); Washington, D. C. (Heidemann); Ag. Coll. Miss. (H. E. Weed). Specimens from the collection of the Ill. State Lab. Nat. Hist. bear the following data:—April 23, on rye; May 7, on strawberry; May 9, on blue-grass; June 22, on wheat. The species was originally described from New Brunswick, N. J. (Smith).

Gnathodus impictus, var. *flavus*, n. var.

Slightly larger and more robust than typical *impictus*. Colour yellow or greenish-yellow throughout, including the subhayline elytra towards the base. Also varying from typical *impictus* in the form of the vertex, face, and male genitalia.

Described from three large series of specimens. The first from Ithaca, N. Y., (Cornell Univ. Coll.). The second from the collection of Mr. Chas. Hart (Illinois:—Acc. Nos. 500-512-514-522-525-526-530-535). The third from the collection of the Ill. State Lab. Nat. Hist., bearing data as follows:—May 15; June 17, on weeds; June 26, on clover; July 2 to 25.

This is one of the most puzzling lot of Jassids that has ever come to my notice. The variation in colour, form, and structure seems extreme, and yet is gradual throughout the whole series. The vertex varies from scarcely at all produced to distinctly produced. The valves in the male vary from not at all produced to the typical form, though the character of the tips is the same in every case. The specimens from Illinois are mostly entirely yellow, though greenish forms occur. On the other hand, those from New York are mostly distinctly greenish-yellow, the yellow forms being rare.

Gnathodus medius, n. sp.

Female: Head narrower than the pronotum. Face about a twelfth wider than long. Front two-fifths longer than wide, length little more than twice that of the clypeus. Clypeus with sides straight, gradually

evenly broadening to a truncate tip, exceeding the genæ more than usual. Genæ of medium width below the loræ. Vertex slightly produced at middle. Pronotum four-fifths wider than long, length four times that of the vertex, curvature little less than half the length, hind margins slightly concave. Last ventral segment truncate, lateral angles curved downward. Ovipositor about equalling pygofer, the latter with scattering short white spines on the apical two-thirds.

Colour yellowish-green. Front with faint indications of one or two transverse arcs. Basal angles of scutellum somewhat darker. Elytra hyaline, with nervures, and costal and inner margins at base, greenish. Sternum greenish. Abdomen above, except margins of segments, black. Length, 4.25 mm.

Pullman, Washington (C. V. Piper). This form is near *impictus*, but is longer and more slender. It also differs in other respects as described above. Larger series from intermediate points, may show it to be but a variety of *impictus*.

Gnathodus manitou, G. & B.

1895. Gillette & Baker, Prelim. List Hemip. Colo., p. 105. Fig.

"Face finely shagreened, a seventh wider than long; clypeus nearly twice as long as broad, rounded at the tip, slightly constricted before the base, basal suture strongly curved; loræ nearly as long and three-fourths as broad as the clypeus; genæ moderately broad, rather deeply depressed beneath the eyes, outer margin angularly incised below the eyes, sharply rounded below, attaining the tip of the clypeus; front one-half longer than broad, twice as long as the clypeus, gradually narrowing below, obtusely rounded above. Vertex one-half longer on the middle than next the eyes, width between the eyes two and one-half times the length at the middle. Pronotum five-sixths broader than long, two and three-fifths times longer than the vertex, curvature two-fifths of the length, posterior margin very slightly concave, anteriorly smooth, posteriorly with scattered feeble punctures, on the posterior median portion finely obliquely rugose, the lines converging backwards. Last ventral segment feebly rounded behind, nearly truncate, pygofer with numerous stout hairs along the whole length. Colour pale green, unicolorous. Elytra hyaline.

"Length, 5 mm. Described from one female.

"Manitou, July (Tucker)."

As this species is only known from the unique type, I quote the original description. The colour should have been stated as yellowish-green instead of pale green

Gnathodus confusus, G. & B.

1895. Gillette & Baker, Prelim. List Hemip. Colo., p. 104. Fig.

"Face one-fifth wider than long; clypeus twice as long as broad, basal suture strongly curved, somewhat constricted near the base, broadest near the tip; loræ about three-fourths as broad and three-fourths as long as the clypeus; genæ broadly depressed beneath the eyes, margin beneath the eyes inverted, broadly rounded below, moderately broad below the loræ and attaining the tip of the clypeus; front one-fifth longer than broad, once and two-thirds the length of the clypeus, superiorly broadly rounded. Face, vertex, and pronotum finely shagreened. Vertex scarcely longer on the middle than next the eyes, width between the eyes slightly more than four times the length at the middle. Pronotum slightly less than twice as broad as long, length nearly four times that of the vertex, curvature about one-half of length, considerably wider than the head, hind margin slightly concave. Transverse groove of scutellum black. Hind margin of last ventral segment of female truncate. Colour yellowish-green. Face sordid yellow, basal angles of the clypeus with an infuscated spot. Vertex of the same colour as the face, with three indistinct longitudinal smoky bands, the ocelli in light areas. Pronotum light yellowish-green on the anterior and lateral margins, darker green on the middle, two dark brown spots medially just back of the anterior margin, the latter in some specimens entirely obsolete. Scutellum pale yellow, basal angles darker. Elytra greenish-subhyaline, slightly maculate with brown near the clavus, somewhat smoky towards the tip. Tergum black with the apical margins of the segments yellow. Venter yellow with the first two or three segments black at the base, pygofers yellowish. Sternum black. Legs yellowish throughout, with infuscated lines on the outside of the femora.

"Length, 3.75 mm. Described from seven females.

"Pleasant Valley, seven miles north-west of Fort Collins, June 12th; Estes Park, July 12th (Gillette); Steamboat Springs, July 12th, on *Carex* (Baker).

"We have a single female specimen which seems distinct from this species, but to which at this time we hesitate giving a name. It differs as follows: The colour more yellowish. Pronotum distinctly less than twice broader than long. Length, 4 mm.

"Estes Park, July 12th (Gillette)."

I quote the original description. Larger series of this species show some variation from the types. With the exception of two specimens from the collection of the Ill. State Lab. Nat. Hist. (Acc. 1880-4620), I have seen no specimens taken outside of Colorado. This form may eventually prove to be a variety of *punctatus*. In *confusus* the vertex is evenly rounded, not produced, while in *punctatus* it is distinctly produced. *Confusus* also lacks the conspicuous maculation of the elytra. In some specimens the markings vary to a bright fulvous.

Gnathodus punctatus (Thunb.) Fieb.*

1782. Thunberg, Act. Ups., VI., p. 21 (*Cicada punctata*).

1866. Fieber, Verh. d. zool.-bot. Gesell, Wien, XVI., p. 505.

(*Gnathodus punctatus*).

1872. Provancher, Nat. Can., IV., p. 378 (*Typhlocyba rosea*).

1890. Provancher, Pet. Faune Ent. Can., III., p. 300-301 (*Typhlocyba punctata* and *T. jocosa*).

1894. VanDuzee, Trans. Amer. Ent. Soc., XXI., p. 307.

Distinguished by the more or less strongly maculated elytra and produced vertex. Otherwise very closely resembling *confusus*. A careful comparison between series of the American forms referred to this species, and authentic specimens of the European *punctatus*, would be very desirable.

This species is probably widely distributed in the U. S. I have collected it at Ag. Coll., Michigan, and at Fort Collins, Colo., and also have specimens from Ithaca, N. Y. (Cornell Univ. Coll.). There is considerable variation in colour, some specimens having strong pink or roseate suffusion, others being quite strongly green.

Gnathodus occidentalis, n. sp.

Head narrower than pronotum. Face an eighth wider than long. Front about a half longer than wide, and twice the length of the clypeus. Clypeus gradually broadening to the very slightly rounded tip. Genæ broad below loræ. Vertex very slightly produced at the middle. Pronotum about seven-eighths wider than long, three and two-thirds the length of the vertex, curvature seven-fifteenths of the length. Last ventral segment of female truncate at tip. Ovipositor equalling pygofers,

*The synonymy of this species is essentially the same as that given by Mr. VanDuzee in his "List of N. A. Jassoidea." The extended European bibliography I do not attempt to give.

the latter with very short, weak, white spines. Valves of male with long white spines on edges of discs, tips produced into finger-like processes as long as discs.

Colour pale green. Face with faint indications of about three brownish arcs. Basal angles of scutellum yellowish. Elytra milky white, with the veins and costal margin greenish. Sternum black. Abdomen above, and beneath at base, except margins of segments, black. Length, 4.25 mm.

Pullman, Washington (C. V. Piper). This form may prove to be a variety of *medius* on the examination of large series, but it differs in having a black sternum and milky elytra.

Gnathodus Livingstonii, n. sp.

Female: Head narrower than the pronotum. Face a twelfth wider than long. Front a fourth longer than wide, somewhat less than twice the length of the clypeus. Clypeus gradually broadening to the truncate tip. Genæ narrow below the loræ. Vertex very slightly and broadly produced, with a small but distinct pit on either side at base, midway between the median line and eye. Pronotum two-thirds wider than long, about four times the length of the vertex; curvature seven-sixteenths of the length, hind margin straight. Hind margin of last ventral segment truncate. Ovipositor about equalling pygofer, the latter with rather long whitish spines on the apical two-thirds.

Colour bright, rather deep, green. Scutellum yellowish at basal angles. Elytra pearly-white, greenish towards the base, nervures broadly green. Sternum, abdomen above and at base beneath except margins of segments, black. Robust. Length, 4.5 mm.

Corfield, Vancouver Island, B. C. (Mr. Clermont Livingston). This is one of many most interesting things which Mr. Livingston's industry has turned up in Vancouver Island, and I take pleasure in dedicating it to him. It is near *occidentalis*, but is longer, more robust, and differs in coloration.

PROSOPIS SUBTILIS.

Prosopis mesillæ, n. n.

Syn. *P. subtilis*, Fox in litt., Ckl., Tr. Am. Ent. Soc., 1895, p. 295.
(Not *P. subtilis*, Forst.)

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